

NONREIMBURSABLE SPACE ACT AGREEMENT
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
AND MARYLAND DEPARTMENT OF THE ENVIRONMENT
FOR SUPPORTING SHELLFISH AQUACULTURE IN THE CHESAPEAKE BAY
USING ARTIFICIAL INTELLIGENCE TO DETECT POOR WATER QUALITY
THROUGH SAMPLING AND REMOTE SENSING.

ARTICLE 1. AUTHORITY AND PARTIES

In accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113(e)), this Agreement is entered into by the National Aeronautics and Space Administration Goddard Space Flight Center, located at 8800 Greenbelt Road, Greenbelt, Maryland 20771 (hereinafter referred to as "NASA" or "NASA GSFC" or "Principal Investigator") and Maryland Department of the Environment located at 1800 Washington Blvd, Baltimore, MD 21230-1701 (hereinafter referred to as "MDE"). NASA and MDE may be individually referred to as a "Party" and collectively referred to as the "Parties."

ARTICLE 2. PURPOSE

The Principal Investigator represents NASA GSFC with MDE as a Co-Investigator on a project managed by the NASA Earth Science Technology Office Advanced Information Systems Technology Program, as described in the proposal "Supporting Shellfish Aquaculture in the Chesapeake Bay using Artificial Intelligence to Detect Poor Water Quality through Sampling and Remote Sensing". The project addresses the challenge of monitoring water quality in the Chesapeake Bay and helps to prepare the greater community to exploit data from future hyperspectral satellite missions, such as Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) currently scheduled to launch in 2023. Using data collected by MDE along with NASA satellite data, the GSFC team is developing an Artificial Intelligence (AI) tool to identify poor water quality indicators with a goal of eventually applying remote sensing of water quality for aquaculture applications. This project aims to reduce the risk and enable new observations capabilities for Earth-observing instruments utilized in space-borne and airborne remote sensing measurements. This is a two-year project that began January 1, 2020.

Technology demonstrated in this project includes data fusion of publicly available satellite data, hull-mounted flow through sampling and artificial intelligence software. The project applies NASA data, science, and technology to support interagency partners (e.g. MDE) in their operations toward the development of a decision support tool for shellfish aquaculture.

ARTICLE 3. RESPONSIBILITIES

A. NASA GSFC will use reasonable efforts to:

1. Manage the project and ensures smooth coordination between field data collection and analysis, satellite data analysis, and AI model training and validation.
2. Purchase boat-mounted DataFlow instruments for use by MDE Shellfish Monitoring boats to detect in situ variables related to water quality.
3. Refine and validate the AI against observed conditions in the Chesapeake Bay, including data from the DataFlow instruments operated by MDE.
4. Collect and analyze all available in situ and remotely sensed data relevant to Chesapeake Bay water quality, including the data collected by the DataFlow instruments, in order to train an AI to identify poor water quality resulting in shellfish bed closure.

B. MDE will use reasonable efforts to:

1. Manage field data collection and operate its boats according to manufacturer guidelines to collect in water measurements while underway to sample sites, ensuring that the DataFlow measurements are not spurious, and providing the data to NASA GSFC.
2. Perform simple routine maintenance tasks to keep the DataFlow instruments in working order, such as wiping them clean if they become biofouled, and following other guidelines from the manufacturer in accordance with the warranty.
3. Provide thresholds and other criteria used to close shellfish beds.

ARTICLE 4. SCHEDULE AND MILESTONES

The planned major milestones for the activities defined in the "Responsibilities" Article are as follows:

NASA will purchase and tag the DataFlow instruments.	Year 1, Quarter 1
NASA will provide the DataFlow instruments to MDE.	Upon Agreement
MDE will operate the DataFlow instruments and provide data to GSFC.	Upon Acceptance of Instruments thru Year 2
MDE will notify NASA GSFC if the instruments fail or if any other issues are encountered during MDE's operation of the instruments.	Upon Acceptance of Instrument thru Year 2
NASA will use the data to train and validate an AI for the benefit of MDE.	Upon Acceptance of Instrument thru Year 2
NASA will report progress during quarterly reports and program reviews.	Throughout Agreement

ARTICLE 5. FINANCIAL OBLIGATIONS

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, (31 U.S.C. § 1341).

ARTICLE 6. PRIORITY OF USE

Any schedule or milestone in this Agreement is estimated based upon the Parties' current understanding of the projected availability of NASA goods, services, facilities, or equipment. In the event that NASA's projected availability changes, MDE shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that NASA's use of the goods, services, facilities, or equipment shall have priority over the use planned in this Agreement. Should a conflict arise, NASA in its sole discretion shall determine whether to exercise that priority. Likewise, should a conflict arise as between two or more non-NASA Partners, NASA, in its sole discretion, shall determine the priority as between those Partners. This Agreement does not obligate NASA to seek alternative government property or services under the jurisdiction of NASA at other locations.

ARTICLE 7. NONEXCLUSIVITY

This Agreement is not exclusive; accordingly, NASA may enter into similar agreements for the same or similar purpose with other private or public entities.

ARTICLE 8. LIABILITY AND RISK OF LOSS

A. Each Party hereby waives any claim against the other Party, employees of the other Party, the other Party's Related Entities (including but not limited to contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors or subcontractor at any tier), or employees of the other Party's Related Entities for any injury to, or death of, the waiving Party's employees or the employees of its Related Entities, or for damage to, or loss of, the waiving Party's property or the property of its Related Entities arising from or related to activities conducted under this Agreement, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct pursuant to the Maryland Tort Claims Act.

B. Each Party further agrees to extend this cross-waiver to its Related Entities by requiring them, by contract or otherwise, to waive all claims against the other Party, Related Entities of the other Party, and employees of the other Party or of its Related Entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement. Additionally, each Party shall require that their Related Entities extend this cross-waiver to their Related Entities by requiring them, by contract or otherwise, to waive all claims against the other Party, Related Entities of the other Party,

and employees of the other Party or of its Related Entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. General

1. "Related Entity" as used in this Data Rights Article means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or MDE, that is assigned, tasked, or contracted to perform activities under this Agreement.
2. "Data," means recorded information, regardless of form, the media on which it is recorded, or the method of recording.
3. "Proprietary Data," means Data embodying trade secrets developed at private expense or commercial or financial information that is privileged or confidential, and that includes a restrictive notice, unless the Data is:
 - a. known or available from other sources without restriction;
 - b. known, possessed, or developed independently, and without reference to the Proprietary Data;
 - c. made available by the owners to others without restriction; or
 - d. required by law or court order to be disclosed.
4. Data exchanged under this Agreement is exchanged without restriction except as otherwise provided herein.
5. Notwithstanding any restrictions provided in this Article, the Parties are not restricted in the use, disclosure, or reproduction of Data provided under this Agreement that meets one of the exceptions in 3. above. If a Party believes that any exceptions apply, it shall notify the other Party before any unrestricted use, disclosure, or reproduction of the Data.
6. The Parties will not exchange preexisting Proprietary Data under this Agreement unless authorized herein or in writing by the owner.
7. If the Parties exchange Data having a notice that the Receiving Party deems is ambiguous or unauthorized, the Receiving Party shall tell the Providing Party. If the notice indicates a restriction, the Receiving Party shall protect the Data under this Article to the extent required or permitted under the Maryland Public Information Act, if MDE is the Receiving Party, unless otherwise directed in writing by the Providing Party.
8. The Data rights herein apply to the employees and Related Entities of MDE. MDE shall ensure that its employees and Related Entity employees know about and are bound by the obligations under this Article.
9. Disclaimer of Liability: NASA is not restricted in, or liable for, the use, disclosure, or reproduction of Data without a restrictive notice or for Data MDE gives, or is required to give, the U.S. Government without restriction.

B. Data First Produced by MDE Under this Agreement

If Data first produced by MDE or its Related Entities under this Agreement is given to NASA, and the Data is Proprietary Data, and it includes a restrictive notice, NASA will use reasonable efforts to protect it. The Data will be disclosed and used (under suitable protective conditions) only for U.S. Government purposes.

C. Data First Produced by NASA Under this Agreement

If MDE requests that Data first produced by NASA under this Agreement be protected, and NASA determines it would be Proprietary Data if obtained from MDE, NASA will use reasonable efforts to mark it with a restrictive notice and protect it for two years after its development. During this restricted period the Data may be disclosed and used (under suitable protective conditions) for U.S. Government purposes only, and thereafter for any purpose. To the extent required or permitted by the Maryland Public Information Act, MDE must not disclose the Data without NASA's written approval during the restricted period. The restrictions placed on NASA do not apply to Data disclosing a NASA-owned invention for which patent protection is being considered.

D. Publication of Results

The National Aeronautics and Space Act (51 U.S.C. § 20112) requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof. As such, NASA may publish unclassified and non-Proprietary Data resulting from work performed under this Agreement. The Parties will coordinate publication of results allowing a reasonable time to review and comment.

E. Data Disclosing an Invention

If the Parties exchange Data disclosing an invention for which patent protection is being considered, and the furnishing Party identifies the Data as such when providing it to the Receiving Party, the Receiving Party shall withhold it from public disclosure for a reasonable time (one (1) year unless otherwise agreed or the Data is restricted for a longer period herein), to the extent required or permitted under the Maryland Public Information Act.

F. Copyright

Data exchanged with a copyright notice and with restrictive notice is presumed to be published. The following royalty-free licenses apply:

1. If indicated on the Data that it was produced outside of this Agreement, it may be reproduced, distributed, and used to prepare derivative works only for carrying out the Receiving Party's responsibilities under this Agreement.
2. Data without the indication of F.1. is presumed to be first produced under this Agreement. Except as otherwise provided in paragraph E. of this Article, and in the Inventions and Patent Rights Article of this Agreement for protection of reported inventions, the Data may be reproduced, distributed, and used to prepare derivative works for any purpose.

G. Data Subject to Export Control

Whether or not marked, technical data subject to the export laws and regulations of the United States provided to MDE under this Agreement must not be given to foreign persons or transmitted outside the United States without proper U.S. Government authorization. NASA anticipates that all data provided to MDE would fall within the fundamental research exclusion of the export laws and regulations (15 CFR § 734.8).

ARTICLE 10. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS

A. "Related Entity" as used in this Invention and Patent Rights Article means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or MDE assigned, tasked, or contracted with to perform activities under this Agreement.

B. The invention and patent rights herein apply to employees and Related Entities of MDE. MDE shall ensure that its employees and Related Entity employees know about and are bound by the obligations under this Article.

C. NASA has determined that 51 U.S.C. § 20135(b) does not apply to this Agreement. Therefore, title to inventions made (conceived or first actually reduced to practice) under this Agreement remain with the respective inventing party(ies). No invention or patent rights are exchanged or granted under this Agreement. NASA and MDE will use reasonable efforts to report inventions made jointly by their employees (including employees of their Related Entities). The Parties will consult and agree on the responsibilities and actions to establish and maintain patent protection for joint invention, and on the terms and conditions of any license or other rights exchanged or granted between them.

ARTICLE 11. USE OF NASA NAME AND NASA EMBLEMS

A. NASA Name and Initials

MDE shall not use "National Aeronautics and Space Administration" or "NASA" in a way that creates the impression that a product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. Except for releases under the "Release of General Information to the Public and Media" Article, MDE must submit any proposed public use of the NASA name or initials (including press releases and all promotional and advertising use) to the NASA Associate Administrator for the Office of Communications or designee ("NASA Communications") for review and approval. Approval by NASA Office of Communications shall be based on applicable law and policy governing the use of the NASA name and initials.

B. NASA Emblems

Use of NASA emblems (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) is governed by 14 C.F.R. Part 1221. MDE must

submit any proposed use of the emblems to NASA Communications for review and approval.

ARTICLE 12. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

NASA or MDE may, consistent with Federal law and this Agreement, release general information regarding its own participation in this Agreement as desired.

Pursuant to Section 841(d) of the NASA Transition Authorization Act of 2017, Public Law 115-10 (the "NTAA"), NASA is obligated to publicly disclose copies of all agreements conducted pursuant to NASA's 51 U.S.C. §20113(e) authority in a searchable format on the NASA website within 60 days after the agreement is signed by the Parties. The Parties acknowledge that a copy of this Agreement will be disclosed, without redactions, in accordance with the NTAA.

ARTICLE 13. DISCLAIMER OF WARRANTY

Goods, services, facilities, or equipment provided by NASA and MDE under this Agreement are provided "as is." NASA and MDE make no express or implied warranty as to the condition of any such goods, services, facilities, or equipment, or as to the condition of any research or information generated under this Agreement, or as to any products made or developed under or as a result of this Agreement including as a result of the use of information generated hereunder, or as to the merchantability or fitness for a particular purpose of such research, information, or resulting product, or that the goods, services, facilities or equipment provided will accomplish the intended results or are safe for any purpose including the intended purpose, or that any of the above will not interfere with privately-owned rights of others. Neither NASA or MDE nor their contractors shall be liable for special, consequential or incidental damages attributed to such equipment, facilities, technical information, or services provided under this Agreement or such research, information, or resulting products made or developed under or as a result of this Agreement.

ARTICLE 14. DISCLAIMER OF ENDORSEMENT

NASA does not endorse or sponsor any commercial product, service, or activity. NASA's participation in this Agreement or provision of goods, services, facilities or equipment under this Agreement does not constitute endorsement by NASA. MDE agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of MDE resulting from activities conducted under this Agreement, regardless of the fact that such product or service may employ NASA-developed technology.

ARTICLE 15. COMPLIANCE WITH LAWS AND REGULATIONS

A. The Parties shall comply with all applicable laws and regulations including, but not limited to, safety; security; export control; environmental; and suspension and debarment laws and regulations. Access by a MDE to NASA facilities or property, or to a NASA Information Technology (IT) system or application, is contingent upon compliance with NASA security and safety policies and guidelines including, but not limited to, standards on badging, credentials, and facility and IT system/application access.

B. With respect to any export control requirements:

1. The Parties will comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 C.F.R. Parts 120 through 130, and the Export Administration Regulations (EAR), 15 C.F.R. Parts 730 through 799, in performing work under this Agreement or any Annex to this Agreement. In the absence of available license exemptions or exceptions, the MDE shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data and software, or for the provision of technical assistance.

2. The MDE shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of work under this Agreement or any Annex under this Agreement, including instances where the work is to be performed on-site at NASA and where the foreign person will have access to export-controlled technical data or software. NASA anticipates that all work performed under this Agreement or any Annex under this Agreement would fall within the fundamental research exclusion of the export laws and regulations (15 CFR § 734.8).

3. The MDE will be responsible for all regulatory record-keeping requirements associated with the use of licenses and license exemptions or exceptions.

4. The MDE will be responsible for ensuring that the provisions of this Article apply to its Related Entities.

C. With respect to suspension and debarment requirements:

1. The MDE hereby certifies, to the best of its knowledge and belief, that it has complied, and shall comply, with 2 C.F.R. Part 180, Subpart C, as supplemented by 2 C.F.R. Part 1880, Subpart C.

2. The MDE shall include language and requirements equivalent to those set forth in subparagraph C.1., above, in any lower-tier covered transaction entered into under this Agreement.

ARTICLE 16. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or two years from the Effective Date, whichever comes first.

ARTICLE 17. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 18. CONTINUING OBLIGATIONS

The rights and obligations of the Parties that, by their nature, would continue beyond the expiration or termination of this Agreement, e.g., "Liability and Risk of Loss" and "Intellectual Property Rights"-related clauses shall survive such expiration or termination of this Agreement.

ARTICLE 19. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Agreement.

Management Points of Contact

NASA Goddard Space Flight Center

James Irons
Director of Earth Sciences
Mail Stop: 610
8800 Greenbelt Road
Greenbelt, Maryland 20771
Phone: 301-614-5620
James.R.Irons@nasa.gov

Maryland Department of the Environment

June Dwyer
Deputy Director, Operational Services
1800 Washington Blvd
Baltimore, MD 21230-1701
Phone: Mgmt. 410-537-4014-

Mgmt. June.dwyer1@maryland.gov

Technical Points of Contact

NASA Goddard Space Flight Center

Stephanie Uz
Applied Sciences Manager
Mail Suite: 610
8800 Greenbelt Road
Greenbelt, Maryland 20771
Phone: 301-286-0549
Stephanie.Uz@nasa.gov

Maryland Department of the Environment

John McKay
Section Head, Shellfish Monitoring
Section
1800 Washington Blvd
Baltimore, MD 21230-1701
Phone: 443-996-2375
John.McKay@Maryland.gov

ARTICLE 20. DISPUTE RESOLUTION

Except as otherwise provided in the Article entitled "Priority of Use," the Article entitled "Intellectual Property Rights – Invention and Patent Rights" (for those activities governed by 37 C.F.R. Part 404), and those situations where a pre-existing statutory or regulatory system exists (e.g., under the Freedom of Information Act, 5 U.S.C. § 552), all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate person identified in this Agreement as the "Points of Contact." The persons identified as the "Points of Contact" for NASA and the MDE will consult and attempt to resolve all issues arising from the implementation of this Agreement. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this Agreement, or their designees, for joint resolution. If the Parties remain unable to resolve the dispute, then the NASA signatory or that person's designee, as applicable, will issue a written decision that will be the final agency decision for the purpose of judicial review. Nothing in this Article limits or prevents either Party from pursuing any other right or remedy available by law upon the issuance of the final agency decision.

ARTICLE 21. INVESTIGATIONS OF MISHAPS AND CLOSE CALLS

In the case of a close call, mishap or mission failure, the Parties agree to provide assistance to each other in the conduct of any investigation. For all NASA mishaps or close calls, MDE agrees to comply with NPR 8621.1, "NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping".

ARTICLE 22. MODIFICATIONS

Any modification to this Agreement shall be executed, in writing, and signed by an authorized representative of NASA and the MDE.

ARTICLE 23. ASSIGNMENT

Neither this Agreement nor any interest arising under it will be assigned by the MDE or NASA without the express written consent of the officials executing, or successors, or higher- level officials possessing original or delegated authority to execute this Agreement.

ARTICLE 24. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of the Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

ARTICLE 25. INDEPENDENT RELATIONSHIP

This Agreement is not intended to constitute, create, give effect to or otherwise recognize a joint venture, partnership, or formal business organization, or agency agreement of any

kind, and the rights and obligations of the Parties shall be only those expressly set forth herein.

ARTICLE 26. LOAN OF GOVERNMENT PROPERTY

The parties shall enter into a NASA Form 893, Loan of NASA Equipment, for the Dataflow instruments owned by NASA and loaned to MDE. At its sole discretion and subject to availability of funding, NASA shall maintain and service the Dataflow instruments, which MDE shall make available for servicing. Notwithstanding any provision to the contrary in NASA Form 893, MDE's liability for loss of or damage to the Dataflow instruments shall not exceed the amount covered by the State of Maryland's self-insurance and, to the extent applicable, commercial insurance policies.

ARTICLE 27. SIGNATORY AUTHORITY

The signatories to this Agreement covenant and warrant that they have authority to execute this Agreement. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
GODDARD SPACE FLIGHT
CENTER

MARYLAND DEPARTMENT OF
THE ENVIRONMENT

BY: _____
Mark Clampin
Director of Sciences and Exploration

BY: **June Dwyer** Digitally signed by June Dwyer
Date: 2021.06.14 11:11:12
-04'00'
June Dwyer
Deputy Director Operational Services

DATE: _____

DATE: _____

Approved as to Form and Legal Sufficiency for MDE this 11th day of June, 2021.



Assistant Attorney General